ADDITIONS TO THE FLORA OF SAINT LAWRENCE ISLAND, ALASKA

STEVEN B. YOUNG

During the summers of 1966 and 1967, I had the opportunity to spend several months traveling around Saint Lawrence Island by Eskimo skinboat and on foot.[1] During this time, botanical collections were made at all locations on the island known to have been visited by earlier botanists, and a number of hitherto unstudied areas were visited. A total of about 1,100 numbers, representing some 235 species of vascular plants, was collected. A complete set of specimens from these collections will be deposited at the Gray Herbarium. Duplicates will be distributed.

The results of this study are being prepared for publication in the form of a major paper. However, due to the present amount of interest in the Beringean region, it seems appropriate to publish a preliminary report on the new material from Saint Lawrence.

Saint Lawrence Island lies in the northern portion of the Bering Sea, some 200 miles due south of the Bering Strait. The largest of the Bering Sea islands, Saint Lawrence has a land area of approximately 2,000 square miles, roughly equal to that of the State of Delaware. The island's terrain is quite varied. About one half of the land surface consists of poorly drained lowlands which usually contain great numbers of small tundra ponds. There are also large areas of rolling uplands, which include several small mountain ranges. The highest peak on the island rises to about 2,200 feet. Sandy barrier beaches and backshores make up a small but floristically rich part of the total land area of the island.

Saint Lawrence's climate is polar maritime. Summer skies are nearly always overcast, and daytime temperatures seldom rise much above 50° F. During the winter months

[1]This study was supported by grants from the Fernald Fund of the Gray Herbarium, The Institute of Evolutionary Biology at Harvard University, and Sigma Xi.

the warming effect of the surrounding sea is largely abrogated by the presence of pack ice, and mean temperatures are only slightly above 0° F. Storms with high winds are frequent throughout the year. Precipitation, mostly in the form of snow, is heavy. The high winds and heavy snowfall combine to form deep drifts in sheltered areas, and these drifts may persist throughout the summer, even at sea level.

In spite of the island's location some 250 miles south of the Arctic Circle, Saint Lawrence supports a typical arctic tundra vegetation. There are no trees, and many of the shrubby species which are usually an important component of the tundra vegetation in low arctic areas are rare or absent on the island.

Because of its location, Saint Lawrence is of considerable biogeographic interest. The island is located in the center of the area which is believed to have been emergent during the glacial maxima of the Pleistocene epoch, forming the Bering Land Bridge (c.f. Hopkins, 1967). There is some evidence that the most recent land connection between Eurasia and North America was by way of Saint Lawrence Island, rather than across the narrowest part of the Bering Strait (Hopkins, loc. cit.). The land bridge was subject to only local glaciation during the Pleistocene, and the entire Beringean Region undoubtedly served as a refugium for many elements of the arctic and boreal biota during the glacial maxima (Hultén, 1937).

Hultén (1941-1950) lists specimens of some 190 species of vascular plants as having been collected on Saint Lawrence Island. In a later volume (Hultén, 1968) additional records bringing the total known flora of the island to 208 species are indicated by dots on distribution maps. The sources of these records and the locations of voucher specimens are not listed, however. The majority of the new records are undoubtedly based on specimens collected by Otto William Geist in the late 1930s, but some other collections may be included. Some of the new records also stem from new identification of older material and from

new interpretations of the taxonomy of some of the species represented.

Sixty-six species not known to Hultén (1941-1950) to occur on Saint Lawrence Island are represented in my collections. A list of these species is given in Table 1. Thirteen of these species are represented by Hultén (1968) as having been collected from the island, but the reports are not substantiated. These species are denoted by an asterisk in Table 1.

About half of the species listed in Table 1 are confined to a few protected localities in the southern part of the island. This is particularly true of the aquatic and semi-aquatic species. About 15 species, otherwise unknown on Saint Lawrence, were found along about two miles of river bank in the south central portion of the island.

Table 1. Additions to the known flora of Saint Lawrence Island

Lycopodium clavatum L. ssp. *monostachyon* (Grev. and Hook.) Sel.
Lycopodium alpinum L.
Equisetum scirpoides Michx.
Equisetum palustre L.
Cystopteris fragilis (L.) Bernh. (subspecies indet.)
Dryopteris fragrans (L.) Schott.
Sparganium hyperboreum Laest.
Potamogeton perfoliatus L. ssp. *Richardsonii* (Bennett) Hult.
Potamogeton subsibiricus Hagstr.
Potamogeton vaginatus Turcz.
Triglochin palustris L.
Calamagrostis neglecta (Ehrh.) Gaertn.
Poa alpigena (E. Fries) Lindm.
Festuca altaica Trin.
Eriophorum Scheuchzeri Hoppe var. *Scheuchzeri*
Eriophorum vaginatum L. ssp. *vaginatum*
Kobresia simpliciuscula (Wahlenb.) Mack.

Carex Jacobi-peteri Hult.
Carex pyrenaica Wahlenb. ssp. *micropoda* (C. A. Mey.) Hult.
Carex stylosa C. A. Mey.
Carex livida (Wahlenb.) Willd.
Juncus sp. (aff. *J. Fauriensis* Buch.)
Luzula multiflora (Retz.) Lej. ssp. *multiflora*
Luzula arctica Blytt
Veratrum album L. ssp. *oxysepalum* (Turcz.) Hult.
Rumex graminifolius Lamb.
Polygonum Bistorta L. ssp. *plumosum* (Small) Hult.*
Claytonia arctica Adams
Stellaria ciliatosepala Trautv.
Minuartia arctica (Stev.) Aschers. & Graebn.
Minuartia obtusiloba (Rydb.) House*
Melandrium affine (J. Vall.) Hartm.
Delphinium brachycentrum Ledeb.*
Ranunculus aquatilis L. (subspecies indet.)
Ranunculus Gmelini DC. ssp. *Gmelini*
Ranunculus pedatifidus J.E. Sm. ssp. *affinis* (R. Br.) Hult.
Ranunculus reptans L.
Cardamine microphylla Adams*
Draba macrocarpa Adams
Draba borealis DC.*
Draba nivalis Liljebl.
Draba alpina L.
Draba hirta L.
Braya humilis (C. A. Mey.) Robins. (ssp. indet.)
Saxifraga oppositifolia L. ssp. *oppositifolia**
Rubus arcticus L.*
Potentilla Egedei Wormsk. var. *Egedei**
Potentilla elegans Cham. and Schlecht.
Potentilla uniflora Ledeb.*
Hedysarum alpinum L. ssp. *americanum* (Michx.) Fedtsch.
Callitriche verna L.
Epilobium anagallidifolium Lam.
Epilobium angustifolium L.
Epilobium palustre L.

Viola biflora L.*
Ligusticum mutellinoides (Crantz) Willar*
Phyllodoce caerulea (L.) Bab.*
Vaccinium uliginosum L.
Primula nivalis Pall.
Trientalis europaea L. ssp. *arctica* (Fisch.) Hult.
Gentiana auriculata Pall.
Eritrichium aretioides (Cham.) DC.
Galium Brandegei Gray
Campanula lasiocarpa Cham. ssp. *lasiocarpa*
Campanula uniflora L.
Aster sibiricus L.

Species marked with an asterisk are treated as members of the Saint Lawrence Island Flora by Hultén (1968), but no substantiation is given.

The following records are of particular interest.

Carex Jacobi-Peteri was previously known only from the type location at Cape Prince of Wales (Hultén, 1968). Although not common on Saint Lawrence, this species was found at several locations.

Carex livida from Saint Lawrence represents a range extension of over 500 miles, the nearest previously known station being in central Alaska (Hultén, 1968). The Saint Lawrence record is also apparently the first of this species from well within the true arctic.

The specimens treated as **Juncus** sp. might be considered either as depauperate specimens of *J. Fauriensis* or as an undescribed species. Only a single small station was found. As far as I can discover, *J. Fauriensis* has not been recorded from Alaska.

Gentiana auriculata has apparently been recorded only once before in Alaska, from Attu Island.

Two infraspecific taxa not included by Hultén (1968) in the flora of Saint Lawrence Island are represented in my collections. These are: *Deschampsia caespitosa* (L.) Beauv. var. **glauca** (Hartm.) Sam. and *Pedicularis sudetica* Willd. ssp. **albolabiata** Hult.

Hultén (1941-1950) lists a number of species as being

of somewhat doubtful occurrence on Saint Lawrence Island. In some cases the records are old and the specimens are no longer available, while in other cases the proveniance of the specimens is in some doubt. In the course of my work, I was able to substantiate a number of old or questionable records. Table 2 lists species which are represented in my collections from Saint Lawrence Island, and whose occurrence on the island might previously have been considered somewhat questionable.

A few species which have been reported from Saint Lawrence should be excluded from the flora of the island until their occurrance there can be substantiated by voucher specimens. Some of these situations are the result of specimens being incorrectly labeled as to collection location, while others result from confusion of the taxonomy of such difficult groups as *Carex*, *Draba*, and *Potentilla*. In either case, one can hardly discredit the record without presenting a detailed discussion of each individual case, which is outside the scope of this paper. Let it suffice to say that some 20 to 30 species which have at one time or another been recorded as occurring on Saint Lawrence should be excluded from the flora of the island until their occurrence there can be substantiated. In most of these cases, I have made intensive searches for the species in question at the location from which they were supposedly recorded, and have failed to find them. The species to be excluded from the Saint Lawrence flora will be discussed in a forthcoming paper.

A similar situation exists with respect to some infraspecific taxa. Hultén (1968) claims that 16 of the species known to occur on Saint Lawrence are represented there by two infraspecific taxa, while two species, *Rubus arcticus* and *Senecio atropurpureus* (Ledeb.) Fedtsch. are supposedly represented by three infraspecific taxa apiece.

My field work leads me to believe that there are very few cases in which two good taxa can be distinguished within a single species on Saint Lawrence Island. The discontinuities which appear to exist are usually the result

Table 2. Species collected on Saint Lawrence whose occurrence was previously substantiated only by old or questionable records.

Hierochloe pauciflora R. Br.
Eriophorum callitrix Cham.
Carex subspathacea Wormsk.
Carex Ramenskii Kom.
Carex nesophila Holm
Carex rariflora (Wahlenb.) J. E. Small
Carex misandra R. Br.
Betula nana L. ssp. *exilis* (Sukatsch.) Hult.
Ranunculus Turneri Greene
Saxifraga spicata D. Don
Pyrola grandiflora Radius
Andromeda polifolia L.
Linnaea borealis L.
Artemisia globularia Cham. ex Besser

of insufficient collecting. For example, *Rubus arcticus* apparently reproduces mainly by vegetative means on Saint Lawrence, with the result that the plant usually occurs as discrete colonies, most of which can probably be considered to consist of a single individual. Nevertheless, the range of morphological variation within a single colony is often so great that three separate subspecies could be distinguished using the key given by Hultén (1968).

Under a fairly conservative taxonomic treatment, it appears that the known vascular flora of Saint Lawrence Island consists of about 240 species. Probably no more than 10 of these species are represented by two or more infraspecific taxa.

INSTITUTE OF POLAR STUDIES
THE OHIO STATE UNIVERSITY, COLUMBUS 43210

LITERATURE CITED

HOPKINS, D. M. (ed.) 1967. The Bering Land Bridge. Stanford: 495 pp.

HULTÉN, E. 1937. Outline of the history of arctic and boreal biota during the Quaternary Period. Stockholm: 198 pp.

———— 1941-1950. Flora of Alaska and the Yukon. Lund Univ. Arsskr., Bd. 37-46: pp. 1-1902.

———— 1968. Flora of Alaska and neighboring territories. Stanford: 1008 pp.

TRIPHORA TRIANTHOPHORA (SW.) RYDB. IN MAINE

A new station for this orchid was found in Stow, Oxford County on August 24, 1969. At the present time this is the only known existing occurrence in Maine. Seymour (Flora of New England 1969) does not record it for the state, although it was reported by Jean Wallace ("The Orchids of Maine", University of Maine Bulletin LIII No. 12: 1951) as growing in the Town of Raymond, Cumberland County in 1915. Two records of the species in Maine are given in Miss Wallace's study, the earlier of which is an article entitled "*Pogonia pendula* in Maine" by LeRoy Harvey (Rhodora II: 211-212, 1900). The station at Stow consists of many individuals growing in small groups on a wooded hillside.

In lieu of specimens, photographs in color taken at the station have been deposited at the Herbaria of the University of New Hampshire and the New England Botanical Club.

LESLEY M. EASTMAN
OLD ORCHARD BEACH, MAINE 04064